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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/871,067

05/31/2001

Shoichiro Yamaguchi

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7590

08/11/2003

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EXAMINER

LEE, JOHN D

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 08/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/871,067

Applicant(s)

YAMAGUCHI ET AL.

Examiner

John D. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

This action is responsive to the amendment submitted on June 20, 2003. The substitute specification has been entered.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,236,785 to Papuchon et al. Papuchon et al discloses a method for forming a periodic polarization-inverted nonlinear optical device in a ferroelectric single crystal substrate (e.g. LiTaO₃). The method of Papuchon et al involves placing a first electrode and a second electrode on a main surface of the substrate, the electrodes being separated by a certain distance d, and applying a voltage between the first and second electrodes to generate and grow a polarization-inverted portion toward the second electrode from the first electrode. Papuchon et al then teaches that, in order to obtain polarization-inverted portions having different characteristics, the distance d between the electrodes may be varied prior to applying the voltage between the first and second electrodes. Thus, while not specifying that this is a sequential step (after forming the first mentioned polarization-inverted portion), the implication is that it can be a sequential process and that a plurality of different characteristic polarization-inverted portions can thus be formed along the length of the substrate. The process set forth in applicant's claims, therefore, would be found by the person of ordinary skill in the art to be an obvious permutation of the Papuchon et al disclosed process. Applicant's claims

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are therefore unpatentable in view of the Papuchon et al reference. Note that the varying of the distance d between the electrodes could mean either shortening or widening such distance. Note also that both of the Papuchon et al electrodes are ctenoid electrodes. The person of ordinary skill would also have found it obvious to adjust the voltages applied to the first and second electrodes in the reference in order to further tailor the characteristics of the polarization-inverted portions that are being created. The polarization axis of the LiTaO_3 substrate of Papuchon et al is not addressed, but it would certainly be arranged so as to provide the optimum polarization inversion efficiency. Therefore, a substrate polarization axis inclination of a specified angle in Papuchon et al would have been obvious.

Applicant's arguments filed on June 20, 2003, have been fully considered but they are not deemed to be persuasive. Applicant acknowledges that distance d between the electrodes in Papauchon et al can be varied prior to applying the voltage between the first and second electrodes as stated in the rejection above (see page 9, lines 16-19, of applicant's response), but argues that this alone (using electrodes 9 and 10 in the reference) does not create the polarization-inverted portions. Applicant argues that this merely reverses the polarization direction of portions already initially polarized by electrodes 7 and 8. With all due respect to applicant's position, the Examiner is not persuaded as to the unobviousness of this step. In the reference, the electrodes 7 and 8 are first used, and then the electrodes 9 and 10 are used. If these electrodes were the same (i.e. if electrode 7 = electrode 9 and electrode 8 = electrode 10) the reference method and the claimed method would be identical. It is believed that it would have

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been obvious to a person of ordinary skill in the art to have these electrodes the same (7 = 9 and 8 = 10), with the shape being changed to crenels when "replacement" is effected, particularly since Papuchon et al does not specifically state that they are two different sets. Note that, even in applicant's claimed method, changing distances between electrodes necessitates removing electrodes from the crystal surfaces, such removal being very much akin to Papuchon's changing between electrodes 7,8 and 9,10. The arguments are not persuasive and the rejection is maintained.

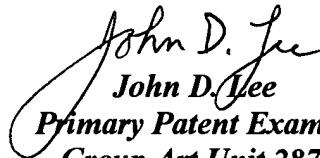
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited U.S. Patent to Tsunoda et al describes a related method for forming periodic polarization-inverted regions in nonlinear optical materials involving the application of voltages to electrodes whose separation distance may be varied.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and an advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR § 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.


John D. Lee
Primary Patent Examiner
Group Art Unit 2874